

2.4 Cumulative Impacts

2.4.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of the proposed project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines Section 15130 describes when a cumulative impact analysis is necessary and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts under NEPA can be found in 40 CFR Section 1508.7.

2.4.2 Methodology

Cumulative impacts were identified by comparing the impacts of the proposed project and other past, current, or proposed actions in the area to establish whether, in the aggregate, they could result in cumulative environmental impacts. Both direct and indirect impacts are assessed. The cumulative effect analysis focuses on those issues and resources that would be affected by aggregation of stress factors on the environment and does not address in detail those topics that would not have additional environmental effects from the cumulative condition. The analysis provided in this section considered the effects of the other projects and the build alternatives in assessing whether a particular environmental parameter would experience cumulative adverse impacts. Specific geographic boundaries for cumulative effects are determined for each environmental topic analyzed and may vary accordingly.

Further growth within the cities and unincorporated areas within and near the project area would require continued expansion of supporting infrastructure such as roadways, commercial uses, public services, and utilities. The anticipated growth is reflected in the regionally adopted growth projections and is planned for in the General Plans of the communities in which the proposed project is located. The following eight steps serve as the guidelines for identifying and assessing cumulative impacts and are based on the *Caltrans Standard Environmental Reference – Cumulative Impacts* (Caltrans, August 5, 2016).¹

1. Identify the resources to consider in the cumulative impact analysis by gathering input from knowledgeable individuals and reliable information sources. This process is initiated during project scoping and continues throughout the NEPA/CEQA analysis.
2. Define the geographic boundary or Resource Study Area (RSA) for each resource to be addressed in the cumulative impact analysis.
3. Describe the current health and the historical context of each resource.
4. Identify the direct and indirect impacts of the proposed project that might contribute to a cumulative impact on the identified resources.
5. Identify the set of other current and reasonably foreseeable future actions or projects and their associated environmental impacts to include in the cumulative impact analysis.
6. Assess the potential cumulative impacts.
7. Report the results of the cumulative impact analysis.
8. Assess the need for mitigation and/or recommendations for actions by other agencies to address a cumulative impact.

2.4.3 Affected Environment

I-405, also known as the San Diego Freeway, has 24 miles in Orange County and 48 miles in Los Angeles County. It is a bypass route to I-5. Within the proposed project limits, I-405 is a controlled-access freeway with 8 to 10 mixed-flow GP lanes, 2 HOV lanes, 6 local interchanges, and 3 freeway-to-freeway interchanges at SR-55, SR-133, and I-5.

I-405 is the part of the NHS that provides access between cities in Orange and Los Angeles counties. The freeway serves the communities of southern Orange County, including the city of Irvine within the project study area. It is used for commuting and intraregional travel, along

¹ http://www.dot.ca.gov/ser/cumulative_guidance/approach.htm; accessed February 2017.

with direct and indirect access to employment centers, recreational attractions, shopping malls, medical centers, universities, airports, and other land uses.

The urbanized project area is located in the southern portion of Orange County. Nine municipalities and unincorporated areas of the County of Orange (including John Wayne Airport) are responsible for land development oversight within the project study area and include the cities of Costa Mesa, Fountain Valley, Irvine, Laguna Woods, Lake Forest, Newport Beach, Mission Viejo, Santa Ana, and Tustin.

Urban growth in the project area was initially established from agricultural business and the two U.S. Marine Corps air facilities in Irvine and Tustin. Dominant land uses comprise of master-planned communities with large boulevards and freeways intersecting homogenous single-family residential communities. Large retail centers serve as significant local landmarks and as areas promoting community cohesion, along with a variety of shopping and services. Most planned development projects include reuse or redevelopment of existing land uses, such as the two military air facilities.

Past, Present, and Reasonably Foreseeable Projects

As shown in Table 2.4-1, the project list comprises past, present, and reasonably foreseeable transportation and land developments, either completed or under construction within the last 5 years or planned for future development. These projects were also identified based on their proximity for direct impacts (3-mile radius) and indirect impacts (5-mile radius), as shown in the cumulative projects map (see Figure 2.4-1). The cities surrounding the project area have experienced considerable growth and urbanization since the region's recovery from the 2007-2009 economic downturn. In addition to residential master-planned communities, this project list also accounted for employment generators such as the construction of new hotels and large-scale corporate headquarters. Long-term growth projections are also considered because they help to identify future actions that could contribute to potential cumulative impacts; the project design year (2050) is used as the planning horizon for considering future projects and actions.

Table 2.4-1 Cumulative Projects List

Map ID#	Project Name	Jurisdiction	Description	Status
Transportation Projects				
1	I-5 (SR-57 to SR-55) Project	Caltrans/OCTA	Addition of a second carpool lane in each direction to relieve traffic congestion, alleviate bottlenecks and improve traffic operations along this corridor.	Construction scheduled early 2018-early 2020.
2	I-5 (I-405 to SR-55) Irvine Tustin Project	Caltrans/OCTA	Addition of one additional NB and SB lane, as well as other capacity and operational improvements, to I-5 adjacent to the cities of Irvine and Tustin.	Currently in PA/ED phase.
3	SR-55 (I-405 to I-5) Improvement Project	Caltrans/OCTA	Widening of SR-55 between I-405 and I-5. Addition of one mixed-flow lane in each direction and fix chokepoints from I-405 to I-5; addition of one auxiliary lane in each direction between select on-/off-ramps through project limits.	Currently in PA/ED phase. Construction is scheduled from mid-2020 to 2025.
4	I-405 Improvement Project (SR-73 to I-605)	Caltrans/OCTA	Widening of I-405 between SR-73 and I-605. The project would improve 16 miles of I-405 by adding a GP lane in each direction from Euclid Street to I-605, plus a new Express Lane from SR-73 to SR-22.	Construction to start in 2018.
5	I-405 SB Auxiliary lane, ramp widening and intersection redesign from Irvine Center Drive to San Diego Creek Bridge	Caltrans/OCTA	Project includes paving an unpaved shoulder adjacent to the auxiliary lane of SB I-405 from Irvine Center Drive to San Diego Creek Bridge in the city of Irvine.	Planned.
6	I-405 SB Auxiliary lane between University Drive/Jeffrey Road and Sand Canyon Avenue	Caltrans/OCTA	Construction of an auxiliary lane on SB I-405 between University Drive/Jeffrey Road and Sand Canyon Avenue.	Construction anticipated for 2018.
7	I-405 SB Auxiliary lane between Sand Canyon Avenue and the SR-133 Connector	Caltrans/OCTA	Construction of an auxiliary lane on SB I-405 between Sand Canyon Avenue and the SR-133 Connector.	Construction is scheduled for 2018.
8	I-405 SB Auxiliary Lane Improvements between Culver Drive Off-Ramp and University Drive/Jeffrey Road Off-Ramp	Caltrans/OCTA	The project includes construction of a new auxiliary lane and new striping of all lanes.	Planned.

Table 2.4-1 Cumulative Projects List

Map ID#	Project Name	Jurisdiction	Description	Status
9	N133/S133-N405 Connector	Caltrans/OCTA	Extend the No. 4 lane on SB SR-133 from SB I-5 Connector and add a second lane to NB 405 Connector.	Construction anticipated to begin in July 2019.
10	Laguna Canyon Road/I-405 OC Widening Project	City of Irvine	Widening of the existing Laguna Canyon Road/I-405 OC from two lanes to four lanes.	Project Report/PSR approved.
11	Red Hill Avenue OC at I-405	Caltrans	Removal, replacement, and reconstruction of the existing roadbed structure at I-405 and Red Hill Avenue OC, SB and NB within the cities of Irvine and Costa Mesa.	Construction began late 2017.
12	SR-55 (I-5 to SR-22)	Caltrans and Cities of Orange, Santa Ana, and Tustin	Proposed new mainline lanes on SR-55 from I-5 to SR-22, including operational improvements and capacity enhancements on SR-55 from SR-22 to SR-91.	In PSR/PDS phase.
13	Jamboree Road/Main Street Intersection Improvement Project	City of Irvine	Roadway widening on Jamboree Road to add a fifth NB through lane, a fifth SB through lane; conversion of the westbound right-turn lane to a standard right-turn lane; to convert eastbound free right-turn lane along Main Street to dedicated dual right-turn lanes.	In preliminary design phase.
14	Jamboree Road/Barranca Parkway	City of Irvine	Intersection improvements at Jamboree Road/Barranca Parkway, including adding a fifth NB through lane.	In preliminary design phase.
15	Jamboree Road Widening at I-5	City of Irvine and City of Tustin	Widening of Jamboree Road to eight through lanes between El Camino Real and Michelle Drive.	Completed.
16	Dyer Road Widening	City of Irvine and City of Santa Ana	Phase II widening of Dyer Road to eight lanes from Red Hill Avenue to SR-55.	Planned.
17	Red Hill Avenue Widening	City of Irvine	Widening of Red Hill Avenue to six lanes from Main Street to MacArthur Boulevard.	Planned.
18	Bristol Street Widening	City of Santa Ana	Widening of Bristol Street to six lanes with three lanes in each direction, with bike lanes, medians, and parkways.	In preliminary design phase.
19	Warner Avenue Improvements	City of Santa Ana	Widening from four to six lanes, Class II bike lanes, medians, curbs, sidewalks, relocate utilities, and other upgrades.	In preliminary design phase.
20	Grand Avenue Grade Separation	City of Santa Ana	Grade separation of Grand Avenue from Wakeham Avenue to Chestnut Avenue.	Project Report-Equivalent has been completed.

Table 2.4-1 Cumulative Projects List

Map ID#	Project Name	Jurisdiction	Description	Status
21	Santa Ana Boulevard Grade Separation	City of Santa Ana	Grade separation of Santa Ana Boulevard from Santiago Street to Grand Avenue.	Planned.
22	Alton Avenue Overcrossing at SR-55	City of Santa Ana	Construction of a four-lane overcrossing with a median connecting each side of SR-55 and the addition of HOV direct access drop ramps to support circulation between the cities of Santa Ana and Irvine.	Planned.
23	Grand Avenue Widening from 1 st Street to 4 th Street	City of Santa Ana	Widening of Grand Avenue from two lanes to three lanes in each direction, an additional turn lane at First Street, a raised median, and bike lanes.	Under construction.
24	Grand Avenue Widening from 4 th Street to 17 th Street	City of Santa Ana	Widening of an approximately 1-mile-long segment of Grand Avenue.	In preliminary design phase.
25	Red Hill Avenue Widening	City of Tustin	Widening of Red Hill Avenue between Edinger Avenue and Valencia Avenue, adjacent to the Pacific Center East Specific Plan area.	Planned.
26	Red Hill Avenue Grade Separation	City of Tustin	Grade separation at Red Hill Avenue and railroad ROW north of Edinger Avenue.	Planned.
27	Edinger Avenue Widening	City of Tustin	Widening of Edinger Avenue between SR-55 and a point 1,400 feet east of Red Hill Avenue.	Planned.
28	Newport Avenue Extension	City of Tustin	Extension of Newport Avenue in two phases south from its existing terminus, under the railroad tracks to Valencia Avenue.	Planned
29	Valencia Avenue Widening	City of Tustin	Widening between Red Hill Avenue and SR-55.	Planned.
30	SR-55 Ramp Construction	City of Tustin	Redesign and construction of the ramps at NB SR-55 and Edinger Avenue.	Planned.
31	Tustin Ranch Road Extension	City of Tustin	Extension of Tustin Ranch Road from its current terminus at Walnut Avenue to Warder Avenue.	Completed.

Table 2.4-1 Cumulative Projects List

Map ID#	Project Name	Jurisdiction	Description	Status
Land Development Projects				
32	Irvine Business Complex (IBC)	City of Irvine	Planned for 5,985 additional dwelling units and 48,787,662 square feet of nonresidential development in the area. Multiple projects recently constructed or under construction, including 1 hotel, Pacific Dental and Edwards Lifesciences office developments, 7 residential projects under construction, and 14 approved residential projects.	Planned. Under Construction.
33	University of California, Irvine Long-Range Development Plan	City of Irvine	Development of classrooms, student, faculty, and staff residences, San Joaquin Marsh Reserve Phase II Restoration Project. Includes Verano Place Apartments, Mesa Court Expansion Project, University Hills Area Faculty and Staff Housing, and Middle Earth Housing Project.	Planned. Under Construction.
34	Laguna Alta Planning Area	City of Irvine	Master-planned residential developments including Hidden Canyon Village, Capri Collection, and Laguna Alta.	Under construction.
35	Irvine Spectrum Planning Areas	City of Irvine	Three Irvine Spectrum planning areas with offices, hotels, commercial, parks, and residential developments, including 400 Spectrum Center, Irvine Spectrum Marriott, Los Olivos Apartment Village, Los Olivos Marketplace.	Under construction.
36	Los Olivos Apartment Village	City of Irvine	Master-planned development of 1,950 apartments, a community park, neighborhood parks, and a school site.	Planned. Under Construction.
37	Los Olivos Marketplace	City of Irvine	Construction of a new commercial center.	Completed.
38	Orange County Great Park/ Great Park Neighborhood	City of Irvine	Master-planned community of residences, schools, parks, and commercial. Includes the following developments: District Next, Parasol Park, Pavilion Park, Base Camp, Altair – Irvine, Solaira Senior Housing, Portola High School, Beacon Park School, 688 Acres at Great Park, Great Park Ice & Sports Complex, Great Park Sports Park, and Broadcom Campus.	Planned. Under Construction.
39	Cypress Village Planning Area	City of Irvine	Master-planned development of residences, neighborhood parks, and two schools.	Planned. Under Construction.
40	Eastwood Village Planning Area	City of Irvine	Master-planned community with residences, parks, and school.	Planned. Under Construction.

Table 2.4-1 Cumulative Projects List

Map ID#	Project Name	Jurisdiction	Description	Status
41	Woodbury Planning Area	City of Irvine	Master-planned community consists of 4,155 units, including public elementary school, public and private parks, and commercial center.	Completed.
42	Woodbury East Planning Area	City of Irvine	Master-planned community with single-family and multi-family residences and private parks.	Completed.
43	Stonegate Planning Area	City of Irvine	Master-planned community with residences, parks, and a school.	Planned. Under Construction.
44	Portola Springs Planning Area	City of Irvine	Master-planned community with residences, parks, and a school.	Planned. Under Construction.
45	19 West Urban Plan	City of Costa Mesa	Mixed-use overlay zone with development standards for land uses, streetscape improvements and urban design improvements, including live/work development.	Planned.
46	Mesa West Bluffs Urban Plan	City of Costa Mesa	Mixed-use overlay zone with development standards for land uses, streetscape improvements and urban design improvements, including live/work development.	Planned.
47	Mesa West Residential Ownership Urban Plan	City of Costa Mesa	Mixed-use overlay zone with development standards for land uses, streetscape improvements and urban design improvements, including live/work development.	Planned.
48	SoBECA Urban Plan	City of Costa Mesa	Planned mixed-use development for live/work.	Planned.
49	North Costa Mesa Specific Plan	City of Costa Mesa	Planned for urban mixed-use development of South Coast Plaza Town Center. Includes Starwood Tribute Hotel Project.	Planned.
50	The Edge by Shea Homes	City of Costa Mesa	The project consists of 19 new single-family detached two-story homes.	Completed.
51	SoCo Collection	City of Costa Mesa	Large-scale commercial shopping center.	Completed.
52	Vans Headquarters	City of Costa Mesa	New Vans headquarters on 15 acres.	Under construction.
53	Downtown Transit Zone: Complete Streets Plan	City of Santa Ana	Plan to create a more walkable, bikeable, vibrant, and healthy environment in Santa Ana's Downtown with a regional transportation hub to regional destinations and to identify opportunities for new investments.	Planned.

Table 2.4-1 Cumulative Projects List

Map ID#	Project Name	Jurisdiction	Description	Status
54	Bristol Street Corridor Specific Plan	City of Santa Ana	Plan provides a comprehensive land use program and urban design guide for the area.	Planned.
55	Legado at the MET	City of Santa Ana	Construction of a 278-unit, 6-story (with lofts) multi-family residential development.	Under review.
56	Heritage Mixed-Use Project	City of Santa Ana	Construction of multi-family apartments with retail space, restaurant space, and office space within the site.	Approved by City Council February 2016.
57	Development Northwest of I-5 and SR-55	City of Santa Ana	Three development projects including Nineteen01 (254-unit apartment building under construction); The Madison (multi-family, mixed-use approved); and AMG First Street Senior Affordable Apartments.	Planned. Under Construction.
58	First Street Family Apartments Project	City of Santa Ana	Construction and operation of 69 all-affordable family apartment units and 119 onsite parking spaces.	Approved.
59	The Met at South Coast	City of Santa Ana	The project consists of 284 multi-family dwelling units in 5- and 6-story condominium buildings over parking.	Approved.
60	Tustin Legacy Specific Plan	City of Tustin	Plan for master-planned community for residential and commercial development of the former MCAS Tustin.	Planned. Under Construction.
61	First Street Specific Plan	City of Tustin	Plan to establish consistent development standards.	Adopted.
62	Pacific Center East Specific Plan	City of Tustin	Plan for an integrated environment of commercial, office, regional and technology uses. Includes completed hotel/commercial mixed-use development.	Adopted.
63	Downtown Commercial Core Plan	City of Tustin	Plan to create a traditional center of Tustin as a pedestrian-oriented community with a commercial core.	Planned.
64	Multiple residential developments in Tustin	City of Tustin	Construction of residential condominiums, apartments, mixed-use developments located at: 1872 San Juan Street, 1381 & 1329 San Juan Street, 1051 Bonita Street, and 13751 & 13841 Red Hill Avenue.	Under construction.
65	Fountain Valley Crossings Specific Plan	City of Fountain Valley	Mixed-use development of residential, retail, and office uses, community gathering facilities and streetscapes.	Under review.

Table 2.4-1 Cumulative Projects List

Map ID#	Project Name	Jurisdiction	Description	Status
66	Uptown Newport Planned Community Development Plan	City of Newport Beach	Development of a high-density mixed-use residential project.	Under construction.
67	Urban Village Specific Plan	City of Laguna Hills	Development policies and standards for the creation of a downtown core.	Planned.
68	Serrano Summit, located on Indian Ocean Drive	City of Lake Forest	Master-planned community of 608 homes, a civic center site, along with various neighborhood parks and roads.	Completed.
69	The Pinnacle at Serrano Highlands	City of Lake Forest	Master-planned community of 85 single-family homes, neighborhood parks, open space, and infrastructure such as roads and utilities.	Planned.
70	Baker Ranch	City of Lake Forest	Master-planned community of 2,379 residential units, nonresidential development, and parks.	Planned. Under Construction.

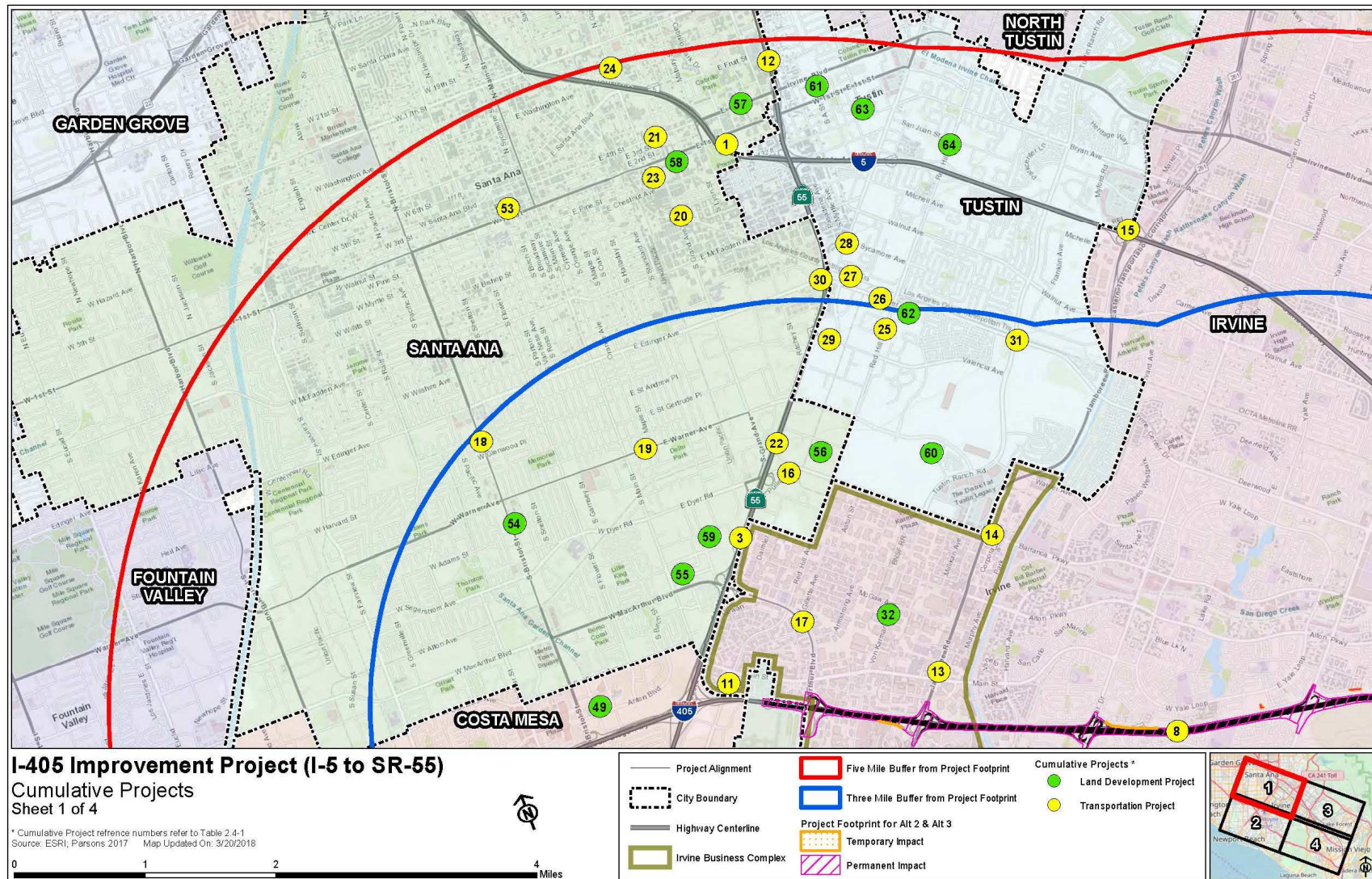


Figure 2.4-1. Cumulative Projects Map (Sheet 1 of 4)

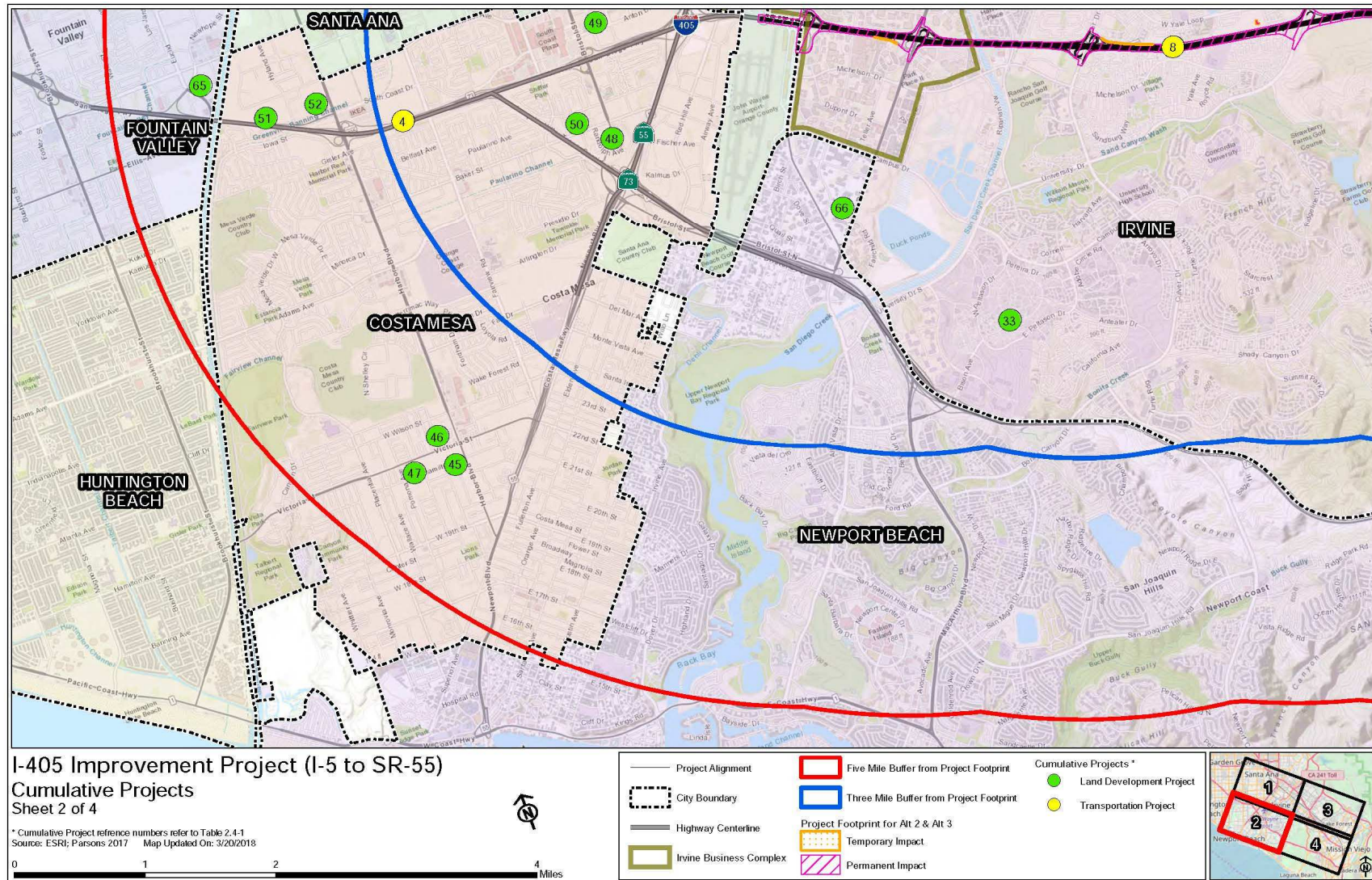


Figure 2.4-1. Cumulative Projects Map (Sheet 2 of 4)

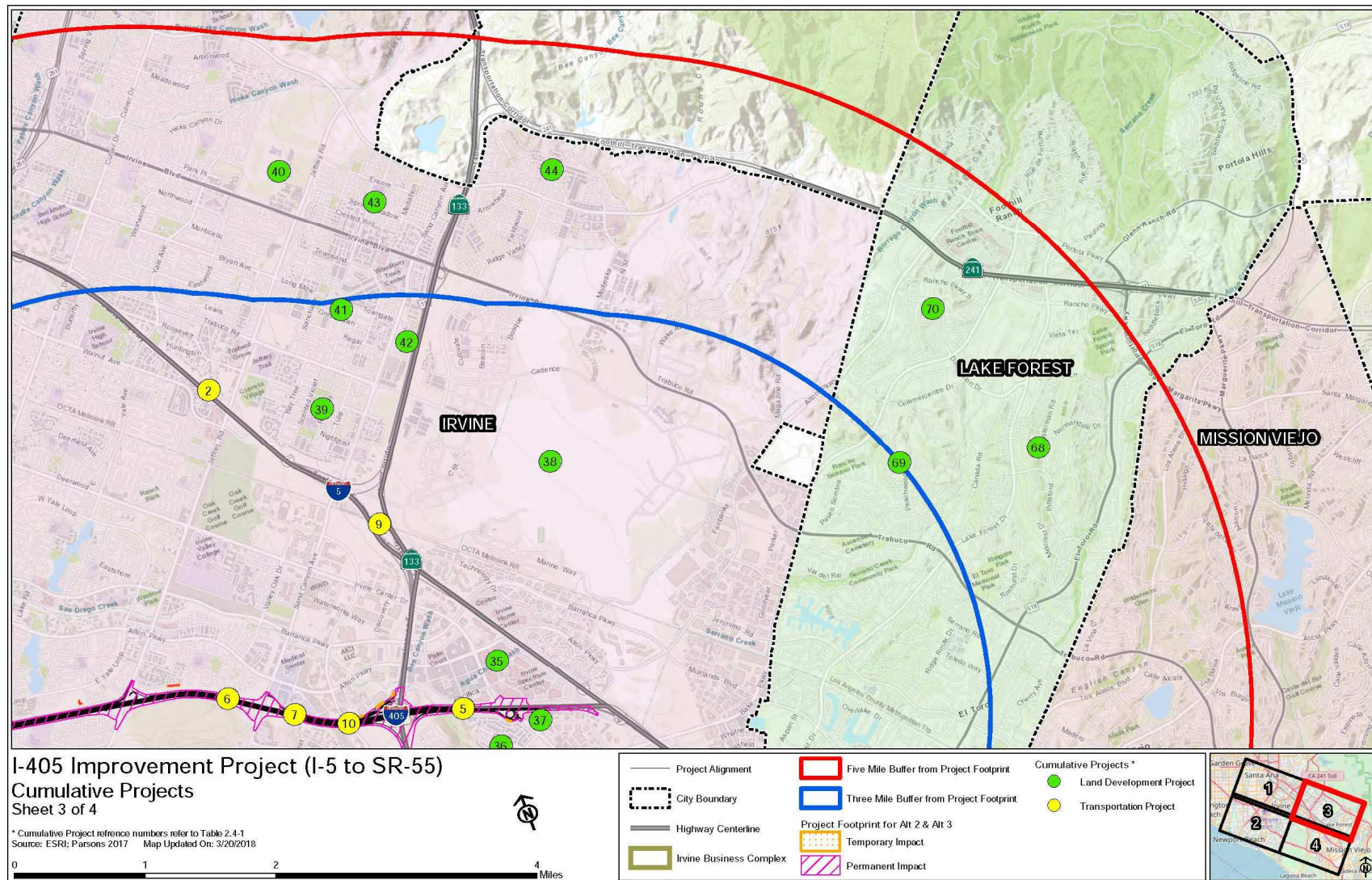


Figure 2.4-1. Cumulative Projects Map (Sheet 3 of 4)

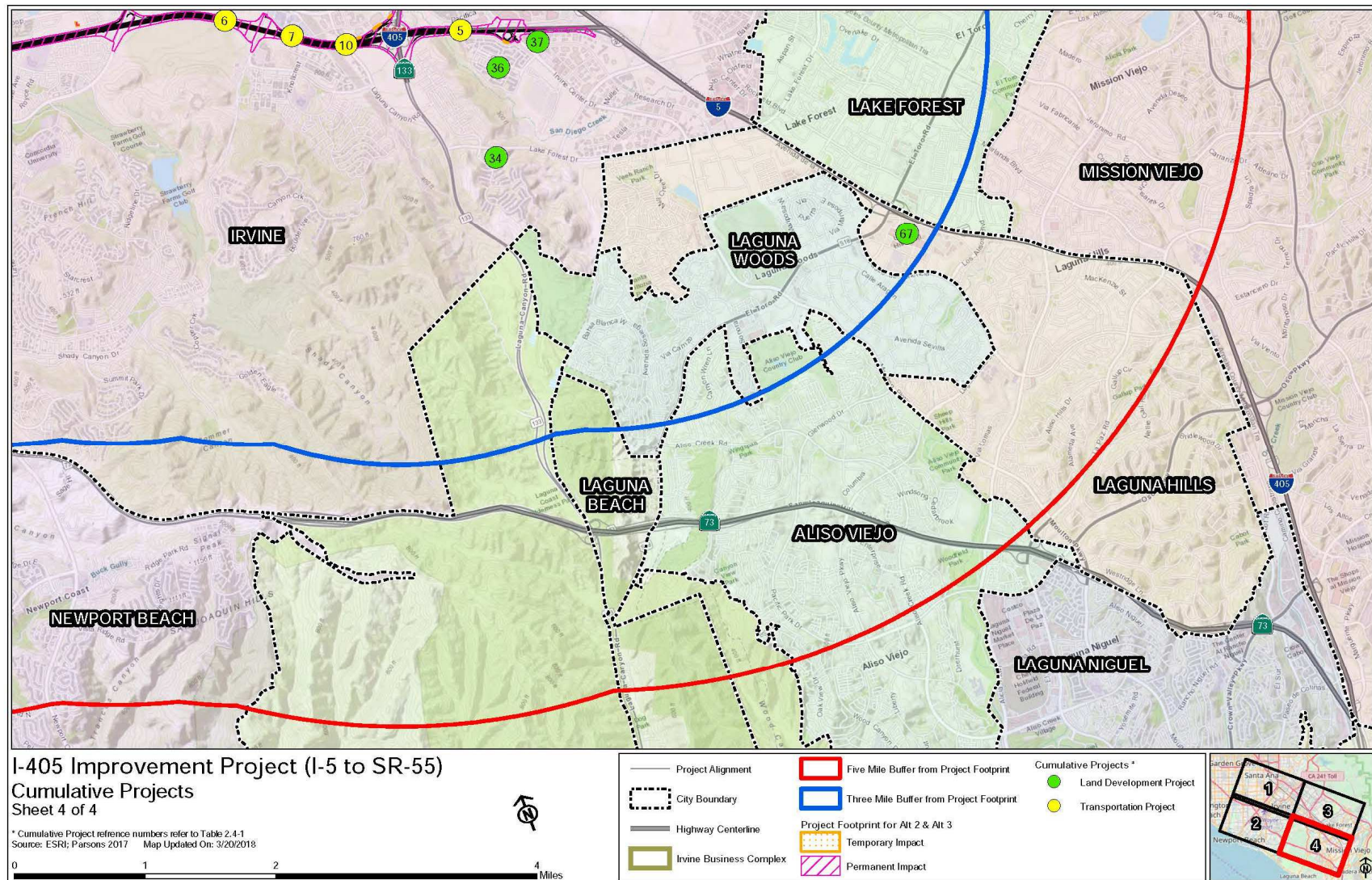


Figure 2.4-1. Cumulative Projects Map (Sheet 4 of 4)

2.4.4 Resources not Subject to Cumulative Impact Analysis

Based on the nature of the proposed project, the affected project area, and the impact analysis for each resource conducted for this IS/EA, it was determined the following resources would not require detailed cumulative impact analysis for the reasons described for each resource.

Land Use

The build alternatives are comprised of freeway improvements that are designated for and currently operating for transportation. The proposed improvements are consistent with local and regional goals to improve traffic circulation and reduce traffic congestion on I-405. The land use environment for the project study area is generally built-out with existing vacant lands planned for future development. For these reasons, construction of the proposed project, in combination with these projects, would not cumulatively contribute to land use impacts. Implementation of mitigation measures described in Section 2.1.1 would minimize potential effects on land use; therefore, no adverse impacts due to land conversion on a cumulative scale are anticipated.

Growth

Transportation projects would not generate long-term additional employment, income, or housing opportunities within the project area and Orange County region. The project area and region are predominantly urbanized with remaining vacant lands planned mostly for residential, recreational, and commercial development. The build alternatives would improve an existing transportation facility and would not induce or hinder growth, nor would it encourage urban growth. Rather, the proposed project would improve current traffic conditions, reduce congestion, and effectively serve existing and future travel demand on I-405. Although this project is generally consistent with applicable state, regional, and local programs, plans, and policies on growth, none of the features of the build alternatives would be integral to the implementation of these growth plans. Therefore, the proposed project would not facilitate planned growth and, in consideration of the other projects in the area, would not contribute to cumulative impacts on existing and planned growth.

Farmlands

Agricultural resources within the project area are limited to grazing land in Irvine. This area has been designated and currently used as preserved open space. Other vacant lands are currently designated and planned for land development. The build alternatives would not directly or indirectly affect the extant grazing land in Irvine; therefore, the proposed project would not contribute cumulatively with other projects in the area.

Community Impacts

The proposed improvements would mostly occur within I-405 ROW. During project construction, temporary disruptions to residential and commercial access would occur. Planned construction from other projects would not occur in the same vicinity as the proposed project; therefore, no cumulative adverse effects to the affected residential and commercial communities are anticipated.

Utilities/Emergency Services

The proposed project would result in temporary impacts to utilities and emergency services during construction. As shown on Figure 2.4-1, transportation and land development projects are evenly distributed along the I-405 project area. Based on the existing urban environment of the project area and the expanse of existing and planned projects along the project corridor, the build alternatives would not contribute to cumulative impacts on utilities and emergency services.

Traffic and Transportation/Pedestrian and Bicycles Facilities

The build alternatives are proposed within an existing transportation corridor. Given past, present, and foreseeable projects within the project area, motorized traffic would experience temporary delays and detours during construction of these projects. Short-term impacts to nonmotorized traffic (i.e., pedestrian and bicycles) would also occur due to project construction. The temporary impacts to motorized and nonmotorized traffic would be minimized with the development of a TMP, which is a requirement for this project and other development projects. The proposed project would improve freeway operations, reduce traffic congestion, and accommodate future traffic from existing and future land developments in the area, which is a benefit to the cumulative project area.

Visual/Aesthetics

The build alternatives, in addition to the identified current and future projects, would widen the freeway, creating a slightly more visual dominant element in the landscape. These projects would likely also decrease the amount of vegetation along the freeway corridor. The purchase of new ROW is an expensive endeavor; therefore, most of the planned improvements to widen I-405 would be at the expense of adjacent highway plantings. However, construction of the build alternatives would also replace landscaping in the project area to the extent feasible. The proposed project would not cumulatively contribute to the existing urbanized landscape and freeway corridor.

The build alternatives, in addition to existing and planned projects in the area, would not affect or substantially change views within the freeway corridor or adjacent properties. Accordingly, the build alternatives would not contribute to cumulative adverse impacts on visual and aesthetics resources in the area.

Cultural Resources

Construction of the proposed project would occur within an area that is considerably disturbed by development, and there are no known cultural resources in the immediate vicinity. If cultural resources are discovered during project construction, measures would be implemented to minimize adverse impacts on cultural resources. Future land development projects in the area would be subject to similar minimum measures if a cultural resource is discovered at their site. With the implementation of measures described in Section 2.1.8, the proposed project would not contribute cumulatively to an adverse impact to cultural resources.

Hydrology and Floodplains

Future development within the San Diego Creek watershed would increase impermeable surfaces and decrease water percolation areas. The increase in runoff volumes from future development would increase overall stormwater volumes and flow rates in local drainage channels and the San Diego Creek. Under the County/City NPDES Permit, the build alternatives, plus other new developments, must provide onsite improvements, including stormwater infiltration facilities or other stormwater runoff controls, and/or storm drainage system upgrades to prevent the creation of flood hazards at downstream areas; therefore, no cumulative adverse impacts related to flood hazards or inadequate storm drainage would occur.

Hazardous Waste/Materials

The build alternatives, in addition to future land development and transportation projects in the area, must comply with applicable local, regional, and state hazardous waste regulations and requirements. Conformance with these regulations would ensure that no cumulative impacts related to hazardous waste/materials would result from construction of the proposed project and other development projects.

Air Quality

As discussed in Section 2.2.6, both the future with project and future no build alternatives show increases in carbon dioxide (CO₂) emissions over the existing levels. The future build CO₂ emissions are higher than the future No Build emissions; however, the proposed project is included in the emissions modeling conducted for Orange County projects (including

cumulative projects for the build alternatives) within the SCAG region for the 2016-2040 RTP/SCS. Therefore, despite the estimated increase in emissions compared to the No Build Alternative, the proposed project is consistent with the 2016-2040 RTP/SCS and the goals to reduce regional emissions. The project's direct impact and contribution on the cumulative scale to climate change can be considered less than adverse. Caltrans is firmly committed to implementing measures to help reduce the potential effects of the project, as described in Section 2.2.6.

Noise

Traffic noise levels, including the maximum noise increase, from construction and operation of the build alternatives, would not be as substantial compared to the cumulative noise levels from existing and future transportation development. This cumulative assessment is largely based on the even distribution of cumulative projects along the I-405 corridor. Direct and indirect noise impacts from the build alternatives would be minimized with the implementation of noise abatement described in Section 2.2.7.4. Accordingly, noise levels from the build alternatives would not contribute cumulatively to adverse noise impacts in the project area.

2.4.5 Environmental Consequences

Parks and Recreation

Portions of two recreational facilities – Freeway Trail and San Diego Creek Trail – are located within the project footprint. In addition, six recreational facilities – Culverdale Wilderness Park, University Community Association Open Space, Irvine Open Space Preserve-Quail Hill, Woodbridge Trail, Jeffrey Open Space Trail, and Shady Canyon Bikeway – are located adjacent to the project footprint. Indirect impacts to all eight recreational facilities located within and adjacent to the project footprint, including visual, air quality, and noise and vibration associated with construction equipment and activities, would be short term and would not inhibit recreational use of these resources. Any indirect impacts would be minimal because the recreational resources are already located in close proximity to the existing I-405 mainline and are located in a built-out environment.

The Freeway Trail is located approximately 500 feet east of the intersection of I-405/Culver Drive and would require a TCE. No permanent changes would occur to the use of the trail, and land would be fully restored to pre-project conditions after construction.

Alternatives 2 and 3 would widen a bridge above the San Diego Creek Trail, which would require prohibiting access to a portion of the trail located northeast of the intersection of

I-405/SR-133. The duration of occupancy would be temporary and at night to avoid disruption of its recreational use. A TCE would be required for the affected area. No permanent changes to the use of the trail would occur, and land would be fully restored to pre-project conditions after construction.

Water Quality and Stormwater Runoff

The geographic context for the analysis of cumulative impacts associated with water quality is the area covered by the hydrologic subarea associated with the proposed project corridor. Development of the proposed project, in combination with all other development that would occur in the watershed area, would involve construction activities, increases in stormwater runoff from new impervious surface area, and possibly reduction in groundwater recharge areas. Construction of new developments throughout the watershed area could result in the erosion of soil, thereby cumulatively degrading water quality.

In addition, the increase in impervious surface area resulting from future development may also adversely affect water quality by increasing the amount of stormwater runoff, transportation-related pollutants, and associated targeted design constituents (TDCs) entering the storm drain system. New development, however, would have to comply with existing regulations regarding construction practices that minimize risks of erosion and runoff. Among the various regulations are the applicable provisions of the Statewide NPDES Permit; County and municipal codes related to control of stormwater quality for new development and significant redevelopment, roads and highways, and public works projects; municipal grading permits; and other NPDES permits. This would minimize degradation of water quality at individual project construction sites.

Consequently, cumulative water quality impacts would be minimized during the construction and operational phases. Compliance with applicable State Water Resources Control Board and Santa Ana Regional Water Quality Control Board regulations would ensure that water quality is maintained to the maximum extent practicable for potential development projects within the watershed area; therefore, there would be no water quality impacts associated with implementation of the proposed project, and the proposed project would not have a cumulatively considerable contribution to the cumulative effects related to water quality.

Paleontology

Cumulative projects listed in Table 2.4-1 and shown on a regional map in Figure 2.4-1 indicate an urbanized environment that has experienced and would continue to experience considerable construction and land use change. Many of these projects require earth-moving activities in

areas underlain by later Cenozoic fossil bearing strata similar to those exposed in the project area. Although individual construction projects usually affect only comparatively small volumes of sediment and sedimentary rock, the combination of Caltrans and other construction projects has a potential for affecting substantial volumes of fossil-bearing sediment and rock. Earth-moving activities in two or more project areas in the same region and underlain by the same stratigraphic unit would have the potential for contributing to cumulative impacts if they resulted in the progressive loss of, or access to, exposures of the rock unit that could be prospected for fossil remains.

On the other hand, fossil remains not previously exposed at the surface would not be uncovered without these earth-moving activities and, therefore, would never be available for recovery and future scientific study by paleontologists. With implementation of appropriate mitigation measures providing for the recovery and treatment of any scientifically important fossil remains exposed by such activities, adverse cumulative impacts resulting from the project would be minimized.

Geology/Soils/Seismic/Topography

The proposed project is expected to have minimal cumulative impacts on geologic and topographic conditions within the project and regional area. The project area generally has a low to negligible potential for geologic hazards such as landslides, expansive soil, collapsible soil, tsunamis, seismic slope instability, and subsidence. Fault rupture potential is remote, and the risk of secondary seismic hazards is generally low. The primary seismic hazard at the site is strong shaking. Geologic and geotechnical constraints affecting project implementation include seismic hazards, landslides and slope instability, liquefaction, and corrosion. Potential adverse effects of the proposed project to these geologic and geotechnical constraints would be minimized, localized, and limited to the grading limits of the project.

Development of the proposed project, in combination with all other development that would occur in the watershed area, would involve construction activities, increases in stormwater runoff from new impervious surface areas, and possibly reduction in groundwater recharge areas. New development, however, would have to comply with existing regulations regarding construction practices that minimize risks of erosion and runoff. This would minimize degradation of water quality at individual project construction sites. In addition, the implementation of Caltrans-approved Treatment BMPs for the proposed project and other cumulative projects would minimize potential pollutant impacts. Consequently, based on these findings, cumulative impacts on geology/soils/seismic/topography resources would be minimized during the construction and operational phases.

Biological Environment

Many of the land development and transportation projects listed above are located in areas that are already urbanized (i.e., consisting of developed, ornamental, and ruderal habitats) and thus would impact only ornamental and disturbed habitat areas considered of low habitat value to native plant and wildlife species. Therefore, loss of habitats due to these projects would not result in a cumulative loss of native habitats and their associated species. While the project and a few of the other transportation projects listed in Table 2.4-1 would incrementally affect biological resources (e.g., widening of bridges over creeks), the primary biological effects have already occurred with original construction of the roadways, and cumulative effects would be expected to be less than substantial.

The cumulative analyses for OCTA's NCCP/HCP and the Central/Coastal NCCP/HCP considered the expansion and improvement of all NCCP/HCP Covered Activities and found that cumulative effects would be less than substantial. Thus, a Biological Opinion was issued for the Central/Coastal NCCP/HCP, and a Biological Opinion was received for the OCTA NCCP/HCP in June 2017. The projects not covered by an NCCP/HCP occur within existing developed areas and would impact only ornamental and disturbed habitat areas considered of low habitat value to native plant and wildlife species. Therefore, loss of habitats to these projects would not result in a cumulative loss of native habitats and their associated species.

Many of the land development and transportation projects listed above are located in areas that are already urbanized (i.e., consisting of developed, ornamental, and ruderal habitats) and would impact only ornamental and disturbed habitat areas considered of low habitat value to native plant and wildlife species. Therefore, loss of habitats to these projects would not result in a cumulative loss of native habitats and their associated species. While the proposed project and a few of the other transportation projects listed above would incrementally affect biological resources (e.g., widening of bridges over creeks), the primary biological effects have already occurred with original construction of the roadways, and cumulative effects would be expected to be less than substantial. Hidden Canyon Village (construction completed) had the potential to impact coastal sage scrub habitats, which are covered by the Central/Coastal NCCP/HCP. Project-specific mitigation measures (e.g., habitat preservation, creation, or payment of in-lieu mitigation fees) would be provided to compensate for the loss of native habitat types. The projects not covered by the NCCP/HCP occur within existing developed areas and would impact only ornamental and disturbed habitat areas considered of low habitat value to native plant and wildlife species. Therefore, loss of habitats to these projects would not result in a cumulative loss of native habitats and their associated species.

Special-Status Plant Species

Southern Tarplant

The southern tarplant is not expected to occur in the BSA; therefore, the project would not contribute to the cumulative loss of this species. As part of the OCTA NCCP/HCP, funding has been approved/provided for the Harriet Weider Regional Park and Fairview Park restoration projects. Although the project would not impact southern tarplant, the OCTA NCCP/HCP will conserve high-quality habitat and will carry out restoration projects to establish this species in suitable habitat. The preserves are better connected to adjacent large blocks of protected habitat than habitat within the project impact area.

Special-Status Animal Species

Coast Horned Lizard

This species is not expected to occur in the BSA; therefore, the project would not contribute to the cumulative loss of this species. As part of the OCTA NCCP/HCP, OCTA has acquired five preserves totaling 888 acres (i.e., Ferber Ranch, Hafen, Hayashi, O'Neill Oaks, and Saddle Creek South) that provide quality habitat for coast horned lizard. Although the project would not impact coast horned lizard, the OCTA NCCP/HCP will conserve high-quality habitat for this species. The preserves are better connected to adjacent large blocks of protected habitat than the fragmented marginally suitable habitat within the BSA.

Cooper's Hawk

Although the Cooper's hawk is not a Covered Species in either NCCP/HCP, it would benefit from the preservation of habitat in both of these plans. A total of 30 breeding territories were observed during focused surveys for the Central/Coastal NCCP/HCP (Bloom, 1999). A total of 85 percent of historic nest locations and 88 percent of suitable habitat were conserved by the Central/Coastal NCCP/HCP (County of Orange, 1996b). Although the project would contribute to the cumulative loss of raptor foraging habitat in the region, the amount is limited in comparison to the amount of habitat that would be conserved under the Central/Coastal NCCP/HCCP and OCTA NCCP/HCP. Therefore, the incremental loss of suitable habitat is considered less than substantial compared to the amount of habitat preserved in the project region.

Ferruginous Hawk

Although the ferruginous hawk is not a Covered Species in either NCCP/HCP, it would benefit from the preservation of habitat in both of these plans. Although the project would contribute

to the cumulative loss of raptor foraging habitat in the region, the amount is limited in comparison to the amount of habitat that would be conserved under the Central/Coastal NCCP/HCCP and OCTA NCCP/HCP.

White-Tailed Kite

Although the white-tailed kite is not a Covered Species in either NCCP/HCP, it would benefit from the preservation of habitat in both plans. Seven breeding territories were observed during focused surveys for the Central/Coastal NCCP/HCP (Bloom, 1999). A total of 94 percent of locations and 88 percent of suitable habitat would be conserved by the Central/Coastal NCCP/HCP (County of Orange, 1996b). Although the project would contribute to the cumulative loss of raptor foraging habitat in the region, the amount is limited in comparison to the amount of habitat that would be conserved under the Central/Coastal NCCP/HCCP and OCTA NCCP/HCP. Therefore, the incremental loss of suitable habitat is considered less than substantial compared to the amount of habitat preserved in the project region.

Southwestern Willow Flycatcher

This species is not expected to occur in the BSA; therefore, the project would not contribute to the cumulative loss of this species. As part of the OCTA NCCP/HCP, OCTA is funding the Aliso Creek restoration project, which includes 55 acres of riparian habitat restoration. The Aliso Creek restoration project has had three occurrences of southwestern willow flycatcher. The riparian habitat restoration and enhancement will provide an immediate benefit to southwestern willow flycatcher habitat. Although the project would not impact southwestern willow flycatcher, the OCTA NCCP/HCP will conserve high-quality habitat for this species.

California Horned Lark, Yellow-Breasted Chat, and Yellow Warbler

The California horned lark and yellow-breasted chat are not a Covered Species in either NCCP/HCP; however, these species would benefit from the preservation of habitat from both plans. Therefore, the incremental loss of suitable habitat is considered less than substantial compared to the amount of habitat preserved in the project region.

Least Bell's Vireo

Although the project would impact a limited amount of habitat for the least Bell's vireo, the OCTA NCCP/HCP will conserve high-quality habitat connected to adjacent large blocks of protected habitat and will carry out restoration projects to improve habitat conditions for this species. Therefore, the incremental loss of suitable habitat is considered less than substantial compared to the amount of habitat preserved in the project region.

Townsend's Big-Eared Bat, Western Mastiff, Western Red Bat, Hoary Bat, and Small-Footed Myotis

Although the Townsend's big-eared bat, western mastiff, western red bat, hoary bat, and small-footed myotis are not Covered Species in either NCCP/HCP, they would benefit from the preservation of habitat in both of these plans. Although the project would contribute to the cumulative loss of bat foraging habitat in the region, the amount is limited in comparison to the amount of habitat that would be conserved under the Central/Coastal NCCP/HCCP and OCTA NCCP/HCP. Therefore, the incremental loss of suitable habitat is considered less than substantial compared to the amount of habitat preserved in the project region.

Bobcat and Mountain Lion

Funding has been approved/provided for compensatory mitigation measures BIO-1, BIO-2, and BIO-4. Although the project would impact a limited amount of habitat for the bobcat and mountain lion, the OCTA NCCP/HCP funded the acquisition and restoration projects to benefit these species. The OCTA NCCP/HCP will conserve high-quality habitat connected to adjacent large blocks of protected habitat and will carry out restoration projects to improve habitat conditions for this species. Therefore, the incremental loss of suitable habitat is considered less than substantial compared to the amount of habitat preserved in the project region.

2.4.6 Avoidance, Minimization, and/or Mitigation Measures

Mitigation for a cumulative impact is often beyond the jurisdiction of FHWA and Caltrans. Successful mitigation measures might require actions by local or regional agencies that have authority for making land use decisions. Therefore, disclosure of mitigation for cumulative impacts is not based on or limited to specific mitigation measures that can be implemented by the lead agency for the proposed project.